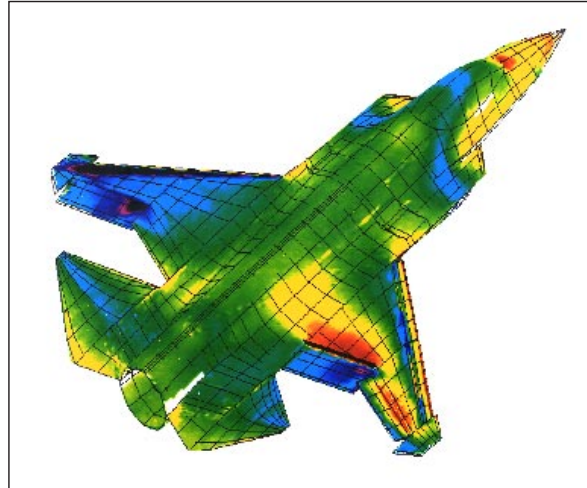




AIR FORCE INDEPENDENT RESEARCH AND DEVELOPMENT (IR&D) BRINGS ARNOLD ENGINEERING DEVELOPMENT CENTER (AEDC) AND INDUSTRY TOGETHER

1



Payoff

As a result of the AEDC/McDonnell Douglas (now Boeing) connection, AEDC acquired the program and source code for *Green Boot*, a pressure sensitive paint software developed by McDonnell Douglas under IR&D and NASA funding. AEDC estimates that their purchase immediately saves them a minimum of \$150,000, which represents two full time computer programmer years for software development. This one technology information connection, created by Laboratory IR&D technology matching experts, resulted in an immediate savings for the government and will ultimately lead to millions of dollars in test savings annually with faster aircraft development cycle time.

Accomplishment

The Air Force Research Laboratory's Independent Research and Development (IR&D) Office, employing their computerized matching procedures, successfully assisted the Arnold Engineering Development Center (AEDC) in finding a solution to their Need 96013, Pressure Sensitive Paint Research to reduce Aircraft Development Cycle Time. Their search of the Defense Technical Information Center IR&D CD-ROM database identified projects being performed by McDonnell Douglas Aerospace that were directly related to the AEDC Need.

Background

Today's state-of-the-art aircraft development typically requires two different wind tunnel models: a pressure model and a force model. The pressure models currently require considerable design and fabrication time to install hundreds of pressure taps on each model's surface. The taps enable pressure measurements at specified locations on the model, but cannot be located on thin parts. Each pressure tap requires precision machining, installation and complex plumbing and wiring to provide information to control room instrumentation. AEDC estimates that the design and fabrication of a full aircraft pressure model typically costs \$1-2 million and requires six months or more to build. When AEDC pressure sensitive paint (PSP) technology has matured in accuracy, speed and acceptance, the force and pressure tests can be conducted concurrently with a single model, saving considerable time and expense. The paint can be applied to any surface where pressure measurements are needed, including thin structures (e.g., fins, control surfaces and struts). The images are recorded using digital cameras. While AEDC PSP technology must improve in accuracy to match traditional pressure taps, it immediately provides a unique capability to acquire comprehensive data where pressure taps are ineffective.